



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/682,880      | 10/29/2001  | Minfeng Xu           | 15MG5559-XU1        | 1809             |

25889 7590 09/07/2004

WILLIAM COLLARD  
COLLARD & ROE, P.C.  
1077 NORTHERN BOULEVARD  
ROSLYN, NY 11576

EXAMINER

TUGBANG, ANTHONY D

|          |              |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

3729

DATE MAILED: 09/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/682,880

**Applicant(s)**

XU ET AL.

**Examiner**

A. Dexter Tugbang

**Art Unit**

3729

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 June 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 8-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 7/9/03, 12/31/01.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of Species A, Claims 1-7, in the reply filed on 6/10/04 is acknowledged. The traversal is on the ground(s) that Claim 1 is readable on all of the Species and that a search for Species A can be done simultaneously with the other Species. This is not found persuasive because, for example, the feature of using a single correction coil to reduce lower order harmonics generated by the magnet in Species A is nowhere recited in any of Species B, C or D. Each of Species B, C, or D specifically require more than one coil. Thus, each Species would have completely different lines of patentability and the searches for each would be non-coextensive placing an undue burden on the examiner to search and examine all of the different Species.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 8-17 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention/species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 6/10/04.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Art Unit: 3729

4. Claims 1-3, 5 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Crozier et al 5,818,319.

Crozier discloses a method of designing a magnetic resonance imaging magnetic comprising: providing at least one correction coil positioned about an axial bore (see Figure 8); and using the correction coil to reduce lower order harmonics generated by the magnet to improve homogeneity of the magnetic field at selected volumes around the magnet (see at least blocks 40, 42 and 46 in Fig. 4 and col. 11, lines 29+).

Regarding Claim(s) 2, Crozier further suggests that the magnet can be a superconducting magnet (see col. 12, lines 60+).

Regarding Claim(s) 3 and 5, in Crozier anyone of the coils (shown in Fig. 8) can be read as a "shimming coil" since shimming occurs (see col. 10, lines 54+) and Crozier uses at least six, if not more than six, coils (see col. 13, lines 13-18).

Regarding Claim(s) 6, Crozier further teaches that the magnet has a longitudinal axis disposed to lie in a horizontal plane (as shown in Fig. 8).

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crozier et al in view of Leue et al 4,680,547.

Crozier discloses the claimed method as relied upon above and further including a cylindrical imaging volume having a design peak-to-peak magnetic field. However, Crozier does not mention that the magnetic field has a design peak-to-peak magnetic field inhomogeneity of less than 10 parts per million with an imaging volume between 20 to 50 cm in diameter, or that the magnetic field strength is 0.5-3.0 Tesla.

Leue suggests that it would be desirable to have a magnetic field with a field strength of 1.5 Tesla and a design peak-to-peak magnetic field inhomogeneity of approximately 2 parts per million in an imaging volume of at least 5 cm in diameter, from an operational standpoint in an MRI device and to control the spatial linearity (see col. 7, lines 23-32).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Crozier by utilizing the magnetic field strength and design peak-to-peak magnetic field inhomogeneity taught by Leue, to positively achieve an operational MRI and control the spatial linearity.

With regards to the imaging volume being between 20 to 50 cm in diameter, this feature is considered to be an effective variable within the level of ordinary skill in the art of manufacturing MRI devices. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided a range of 20 to 50 cm in diameter of the imaging volume of the magnetic field, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

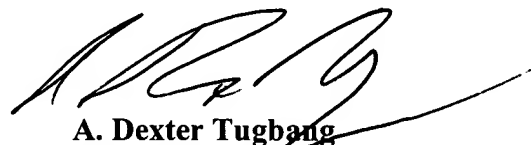
***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Dexter Tugbang whose telephone number is 703-308-7599. The examiner can normally be reached on Monday - Friday 7:00 am - 3:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 703-308-1789. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
**A. Dexter Tugbang**  
**Primary Examiner**  
**Art Unit 3729**

August 31, 2004